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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,376	03/03/2005	Yoshio Nakano	266108US3PCT	3840
22850	7590	06/24/2010		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
WOOD, ELLEN S				
ART UNIT		PAPER NUMBER		
1782				
NOTIFICATION DATE		DELIVERY MODE		
06/24/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/526,376

**Applicant(s)**

NAKANO ET AL.

**Examiner**

ELLEN S. WOOD

**Art Unit**

1782

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9, 11-13, 21 and 25-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) 9, 11-13, 21 and 25-30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 9, 11, 12, 13, 21, 25, 26, 27, 28, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yukinobu et al. (JP 2001-182872, hereinafter "Yukinobu") in view of Besche et al. (US 6,761,188, hereinafter "Besche") in further view of Tamura et al. (US 4,973,440, hereinafter "Tamura").

In regards to claim 9, Yukinobu discloses a hose for transportation which uses carbon dioxide as a refrigerant [0001]. The tube is formed from a metal accordion tube that is of a bellows shape [0010]. The tube has troughs and ridges (drawings 1 and 2). A wrap reinforcement layer (fiber braid reinforcement) (3) covers the bellows [0013 and drawings 1-2]. A wrap elastic layer (buffer material) (2) [0011] was extruded over the tube so that the dent part (troughs) of bellows were filled thoroughly [0016 and drawings 1-2]. The cross section of the bellows has a sequence of U-shapes (drawings 1 and 2). The wrap elastic layer is formed from rubber or thermoplastics, such as nitril butadiene rubber, chloroprene rubber, isobutylene isoprene rubber, acrylic rubber, and ethylene acrylic rubber [0011]. Yukinobu discloses that the wrap reinforcement layer is formed from PET fibers (polyester), nylon fibers, aramide fibers, carbon fibers, etc. [0013].

In regards to claims 12, Yukinobu discloses that the reinforcement layer may be surrounded by an external layer of the same materials of the elastic layer [0014]. The additional unvulcanized rubber layer is twisted around outer layer of this reinforcement [0017], thus impregnated.

In regards to claims 21, 25 and 27, Yukinobu discloses that the tube is disposed in piping for a carbon dioxide refrigerant system [0001].

In regards to claims 29-30, Yukinobu discloses that the wrap elastic layer does not need to bury the dent part of the accordion tube for a metal layer thoroughly [0011]. The resin fills up to the dent part of the accordion tube [0012].

Yukinobu is silent with regards to the braided angle of the reinforcement covering, the buffer material covering a height that is 0.5 to 2.0 times the height of the ridges and the additional layer of fiber braid reinforcement.

Besche discloses a flexible hose line (col. 1 lines 6-8). The inner layer can also be a corrugated tube (col. 1 lines 58-62). A compensation zone (buffer material) that is located between the inner layer and the reinforcing layer (col. 1 lines 33-37) is formed from an elastomer, a thermoplastic elastomer, or a thermoplastic (col. 2 lines 18-21). The hose is reinforced by a layer that is designed to absorb tensile forces acting in the longitudinal direction of the hose (col. 1 lines 28-33). The reinforcing layer is formed from threads or thread groups that are oriented in the axial direction, they can be loaded in the longitudinal direction of the hose and they run at an angle of preferably  $35^{\circ}$  to  $45^{\circ}$  (col. 3 lines 5-9).

It would be obvious to one of ordinary skill in the art to have combined the braiding angle of Besche with the wrap fiber layer of Yukinobu, because the braiding angle provides proper orientation of the reinforcement layer, thus maintaining the absorption of the tensile forces acting on the hose.

It would be obvious to one of ordinary skill in the art to have used a buffer material that covers the outer face from the bottom of the troughs to a height that is 0.5 to 2.0 times the height of the ridges in the combination of Yukinobu and Besche, to insure flexibility of the accordion tube and that the internal pressure applied to a metal layer is disturbed equally [Yokinobu 0009].

Yukinobu and Besche both disclose an additional layer of elastomeric covering on the outer side of the reinforcing layer. It would be obvious to one of ordinary skill in the art to use an additional fiber reinforcing material to provide additional stability and strength to the hose.

The combination of Yukinobu and Besche has been discussed previously. The combination of Yukinobu and Besche is silent with regards to the fiber braid reinforcement being impregnated with a curable resin such as those listed in claim 11.

Tamura discloses reinforcing fibers that are inorganic fibers such as carbon fibers or glass fibers or organic fibers such as vinylon fibers or alamides fibers (col. 5 lines 13-17). The vinyl ester resin impregnated into the fibers is derived from epoxy resin and vinyl ester resin (col. 5 lines 2-12).

It would be obvious to one of ordinary skill to combine the impregnated reinforcing fibers of Tamura with the reinforcing layer of the combination of Yukinobu

and Besche, because the thermosetting resin composition of the impregnated reinforcing fibers provides a fiber-reinforced molding material that has uniformly dispersed fibers in an unbroken state that provides outstanding impact strength and stability (col. 9 lines 7-28).

### ***Response to Arguments***

3. Applicant's arguments filed 03/30/2010 have been fully considered but they are not persuasive.
4. The applicant argues that there is no motivation to modify Yukinobu with Tamura, because Tamura discloses a fiber-reinforced thermosetting resin molding for hot pressing injecting.

In response, Tamura disclose reinforcing fibers that are impregnated with the resin composition (col. 5 lines 30-34). The resin composition is derived from epoxy resin and vinyl ester resin (col. 5 lines 2-12), which are curable resins. Tamura discloses a fiber-reinforced molding material that produces shaped articles of outstanding impact strength (col. 9 lines 25-28). Yukinobu uses a wrap reinforcing material. Tamura discloses a fiber-reinforced molded material that is impregnated with a curable resin that produces shaped articles. Thus, the Yukinobu and Tamura both disclose reinforcing material that is produced from fibers. The advantage of Tamura is that the additional impregnation of the curable resin provides additional strength to the material. Therefore, the motivation to modify Yukinobu with Tamura would be to provide additional impact strength and stability to the reinforcing material.

5. The applicant argues a further advantageous feature of one or more examples of the invention can be shown from the Table attached to the present amendment.

In response, the applicant did not provide the additional table to show advantageous of the applicant's invention.

6. The applicant argues that the applied art does not teach or suggest that the buffer material covers an outer face of the bellows from the trough to a height below the height of the ridge.

In response, Yukinobu discloses that the wrap elastic layer does not need to bury the dent part of the accordion tube for a metal layer thoroughly [0011]. The resin fills up to the dent part of the accordion tube [0012].

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELLEN S. WOOD whose telephone number is (571)270-3450. The examiner can normally be reached on M-F 730-5 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571)272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ELLEN S WOOD/  
Examiner, Art Unit 1782

/Rena L. Dye/  
Supervisory Patent Examiner, Art Unit 1782